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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,662	06/23/2005	Viatcheslav Dmitrievich Shapovalov	0065.0002US1	2898

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EXAMINER	
VELASQUEZ, VANESSA T	
ART UNIT	PAPER NUMBER
4116	
MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/540,662	SHAPOVALOV ET AL.	
	Examiner	Art Unit	
	Vanessa T. Velasquez	4116	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *6-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *6-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 June 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Application

Claims 6-36 are pending and are presented for examination on the merits.

Submitted References Considered

Copies of references listed in the International Search Report for PCT/RU03/00170 were received June 12, 2006. Accordingly, the Examiner is considering the references.

Abstract

1. The abstract of the disclosure is objected to because it is not printed on a separate sheet of paper and contains more than 150 words. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

Correction is required. See MPEP § 608.01(b).

Claim Objections

2. Claims 22 and 27 are objected to because of the following informality: typographical error. Either the word "the" or the phrase "at least one" should be omitted. Appropriate correction is required.

Claim Rejections - 35 USC § 112 - 2nd Paragraph

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 10-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. The claims recite the limitation "NO." There is insufficient antecedent basis for this limitation in the claim, as the claims depend on claim 6, which fails to identify NO as a specific oxidizing nitrogen compound. The Examiner will construe the claims to refer to the oxidizing nitrogen compound of claim 6.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 6-13, 15-29, and 33-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raudsepp et al. (US 4,647,307).

Regarding claims 6 and 20, Raudsepp et al. teach a hydrometallurgical process for extracting precious metal from sulfide-containing ores. The process comprises forming a slurry of the ore, acid, and water (Raudsepp et al., Col. 3, Lines 25-28) and treating the slurry with an oxidizing nitrogen compound (Raudsepp et al., Col. 3, Lines 29-39). The process may further include neutralizing sulfuric acid produced during the process (Raudsepp et al., Col. 4, Lines 36-42).

Regarding claim 7, the nitrogen compound may be HNO_3 (Raudsepp et al., Col. 4, Lines 4-11).

Regarding claim 8, Raudsepp et al. disclose using NO, NO_2, and N_2O_4 as possible oxidizing compounds to initiate their process (Col. 4, Lines 4-9), but fail to include N_2O_3 in the list. Although Raudsepp et al. is silent as to the use of N_2O_3, the compound is recognized as capable of oxidizing substances (see supporting reference US 2002/0098345 A1, Paragraph [0143]); thus, one of ordinary skill in the art would

expect to achieve substantially similar results if the compound were incorporated into the process of Raudsepp et al.

Regarding claim 9, the nitrogen compounds used to initiate the process are regenerated after being exposed to O_2 gas (Raudsepp et al., Col. 10, Lines 1-6).

Regarding claims 10-12, the nitric oxide produced by the reaction of the slurry and a nitrogen species is oxidized with O_2 (Raudsepp et al., Col. 3, Lines 42-44). Raudsepp et al. do not specifically teach the formation of N_2O_3; however, the oxidation of nitric oxide produces a compound containing nitrogen that has a valence of at least plus 3 (Col. 3, Lines 45-46). The nitrogen in N_2O_3 has an oxidation number of plus 3. In addition, the oxidized nitrogen species is redistributed to the slurry to further oxidize the matter contained therein (Raudsepp et al., Col. 3, Lines 51-54).

Regarding claim 13, Raudsepp et al. do not teach oxidizing nitric oxide in air. However, air contains oxygen molecules and would still be capable of oxidizing a nitrogen compound. It would also be obvious to one of ordinary skill in the art to try to use air because it requires no special equipment (e.g., tanks, pumps) and incurs no financial costs.

Regarding claims 15 and 16, the compounds recited in the claim are all widely used substances for neutralizing acidic media. For instance, Raudsepp et al. use calcium-based compounds (e.g., calcium hydroxide) to partially neutralize acidic solutions (Col. 12, Lines 39-45). It would be routine practice for one of ordinary skill in the art to determine the amount of neutralizing substance necessary to effect a desired result.

Regarding claim 17, the slurry is agitated to ensure that particles remained suspended in solution (Raudsepp et al., Col. 14, Lines 55-59).

Regarding claim 18, the process takes place at a temperature between 20°C and 80°C (Raudsepp et al., Col. 4, Lines 21-23).

Regarding claim 19, Raudsepp et al. are silent as to the liquid-solid ratio of the slurry; however, it would be routine practice for one of ordinary skill in the art to determine an optimum viscosity of the slurry in order to obtain the best results.

Regarding claims 21 and 22, cyanide extraction is one of several known extraction techniques (Raudsepp et al., Col. 13, Lines 57-62).

Regarding claims 23 and 24, refer to 35 U.S.C. 103(a) rejections of claims 6 and 16. It would clearly be within the reach of one of ordinary skill in the art to control the amount of sulfuric acid generated in the slurry. For instance, one could manipulate the amount of base to neutralize the slurry. Controlling the amount of base added to the slurry would be routine practice for one of ordinary skill in the art.

Regarding claim 25, Raudsepp et al. teach a process comprises forming a slurry of the ore, acid, and water (Raudsepp et al., Col. 3, Lines 25-28) and treating the slurry with an oxidizing nitrogen compound (Raudsepp et al., Col. 3, Lines 29-39). Nitric oxide is generated in the treatment step (Raudsepp et al., Col. 3, Lines 29-39) and is subsequently oxidized (Raudsepp et al., Col. 3, Line 42). The process may further include neutralizing sulfuric acid produced during the process (Raudsepp et al., Col. 4, Lines 36-42).

Although Raudsepp et al. is silent as to the use of N_2O_3, the compound is recognized as capable of oxidizing substances (see supporting reference US 2002/0098345 A1, Paragraph [0143]); thus, one of ordinary skill in the art would expect to achieve substantially similar results if the compound were incorporated into the process of Raudsepp et al. Furthermore, Raudsepp et al. do not specifically teach the formation of N_2O_3; however, the oxidation of nitric oxide produces a compound containing nitrogen that has a valence of at least plus 3 (Col. 3, Lines 45-46). The nitrogen in N_2O_3 has an oxidation number of plus 3.

Regarding claims 26 and 27, cyanide extraction is one of several known extraction techniques (Raudsepp et al., Col. 13, Lines 57-62).

Regarding claim 28, the nitric oxide produced by the reaction of the slurry with a nitrogen species is oxidized with O_2 (Raudsepp et al., Col. 3, Lines 42-44).

Regarding claim 29, Raudsepp et al. do not teach oxidizing nitric oxide in air. However, air contains oxygen molecules and would still be capable of oxidizing the nitrogen compound. It would also be obvious to one of ordinary skill in the art to try to use air because it requires no special equipment (e.g., tanks, pumps) and incurs no financial costs.

Regarding claim 33, the slurry is agitated to ensure that particles remained suspended in solution (Raudsepp et al., Col. 14, Lines 55-59).

Regarding claim 34, see 35 U.S.C. 103(a) rejection pertaining to claim 23.

Regarding claim 35, the process takes place at a temperature between 20°C and 80°C (Raudsepp et al., Col. 4, Lines 21-23).

Regarding claim 36, Raudsepp et al. are silent as to the liquid-solid ratio of the slurry; however, it would be routine practice for one of ordinary skill in the art to determine an optimum viscosity of the slurry in order to obtain the best results.

9. Claims 14 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raudsepp et al. (US 4,647,307) in view of O'Brien (WO 94/17216).

Regarding claims 14 and 30, Raudsepp et al. do not teach removing inert nitrogen from a gas stream containing N_2O_3 or NO. O'Brien discloses a hydrometallurgical process in which one step comprises treating nitrous oxide in order to make it safe for the environment (p. 7, Lines 24-31). O'Brien's process resembles remediation techniques in which poisonous substances are specifically targeted, treated, and removed from the system. In the instant case, the environmentally safe product (i.e., inert nitrogen) is separated from oxidizing nitrogen compounds and removed.

One of ordinary skill in the art at the time of the invention could incorporate a remediation and removal step similar to that of O'Brien into the process of Raudsepp et al. in order to remove unnecessary gases (in this case, nitrogen). One would be motivated to remove nitrogen because it is not a reagent in the regeneration of the oxidizing nitrogen compounds and its presence would consume space in the reaction chamber.

10. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Raudsepp et al. (US 4,647,307) in view of Miller (US 4,155,989).

Refer to 35 U.S.C. 103(a) rejection of claim 11. Raudsepp et al. fail to teach a denitration step after absorption of the oxidizing nitrogen species into the slurry. Miller discloses a method in which a mixture of sulfuric and nitric acids is denitrated (Col. 3, Lines 31-33).

It would be obvious to one of ordinary skill in the art to modify the process of Raudsepp et al. by incorporating the denitrating step of Miller because making such a modification would remediate harmful sulfuric and nitric acids and prevent them from being introduced into the environment.

11. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Raudsepp et al. (US 4,647,307) in view of Kato et al. (US 4,798,813).

Raudsepp et al. fail to teach a step in which denitration occurs after exposing NO to a copper salt solution. Kato et al. teach a copper-containing denitration catalyst (Col. 2, Lines 43-45) for removing nitrogen oxide exhaust gases (Abstract).

It would be obvious to one of ordinary skill in the art to remediate the nitrogen oxide gases produced in the method of Raudsepp et al. using the copper catalyst of Kato et al. because nitrogen oxide gases pose serious health and environmental concerns; thus, preventing their release into the environment is desirable.

Pertinent Prior Art

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

13. **US 5,236,492** Shaw et al. teach a hydrometallurgical method for extracting precious metals from sulfide-containing ores. Relevant steps include treating the ores with sulfuric and nitric acids, recovering and recycling NO_x gases to treat slurry, adding base solutions to increase the pH of the slurry, and recovering the precious metals using known techniques such as cyanidation.

14. **US 4,670,051** Schneider teaches a method for recovering metal from a refractory ore. The ore is mixed with nitric acid to form slurry. The process is continuous and avoids the release of harmful gases into the atmosphere.

Conclusion

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VANESSA T. VELASQUEZ whose telephone number is (571)270-3587. The examiner can normally be reached on Monday-Friday 7:30 AM-5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on 571-272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Vanessa T Velasquez/
Examiner, Art Unit 4116

/Vickie Kim/

Supervisory Patent Examiner, Art Unit 4116